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EXAMINER	
EHICHIOYA, FRED I	

ART UNIT	PAPER NUMBER
2162	

DATE MAILED: 01/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/783,820	PUDIPEDDI ET AL.	
	Examiner	Art Unit	
	Fred I. Ehichioya	2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 24, and 26 - 30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 24, and 26 - 30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant argues:

(a). Lerman teaches, at best, that each drive has its own queues, and not that each media has it own queue (page 9, paragraph 2).

(b). There is no cited reference that teaches organizing requests on a queue in increasing order of offset (page 9, paragraph 4).

(c). Lerman does not teach the feature of concurrent retrieval (page 10, paragraph 1).

(d). The portion of Pence that has been cited teaches, at best, the time stamping of individual requests, not entire queues. ..... Since Pence uses only one queue, time stamping that queues would be meaningless (page 10, paragraph 2).

Regarding the argument (a): Examiner respectfully disagrees with the applicants. Lerman in column 3, lines 35 – 37, teaches that each media has it own queue (each disks 120 has its own internal queue 125_1 through 125_n (collectively queue 125) for buffering access requests). Microsoft Computer dictionary, 5th edition page 332 defines disks as media.

Regarding argument (b): Examiner respectfully disagrees with the applicants. The applicants state that "an "offset" into a media is a way of describing a given data item's location" see page 9, paragraph 4 of the argument. There Lerman discloses "organizing requests on a queue in increasing order of offset" (see abstract "The queue

selector establishes priority in response to the location of the data upon a disk in a disk drive, and data may be stored in the disk drive based upon queuing priority". Lerman also discloses in column 2, lines 20 – 25 that the requests are ordered in each of the queues.

Regarding argument (c): Examiner respectfully disagrees with the applicants. Lerman discloses concurrent retrieval as shown in column 1, lines 39 – 42 and also disclose handling multiple commands simultaneously among disks as shown in column 8, lines 48 – 52.

Regarding argument (d): Examiner respectfully disagrees with the applicants since the rejection of claims 7 and 23 is based on applied references of Lerman and Pence. Lerman teaches a plurality of queues, see column 2, line 15 and column lines 5 – 14); The examiner agrees with the applicants that Pence teaches time stamping as disclosed in the arguments on page 10. However, the combination of Lerman and Pence clearly suggests time stamping the queues at the time of creation.

2. Applicant's arguments filed September 14, 2004 have been fully considered but they are not persuasive. Therefore, last Office Action is proper.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 3, 7, 9, 10, 22, 23, 26, 28, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,378,036 issued to Jesse S. Lerman et al. (Hereafter "Lerman") in view of U.S. Patent 6,279,074 issued to Jerry Wayne Pence (hereafter "Pence").

Regarding claim 1, Lerman teaches a method of recalling data objects stored on a plurality of media comprising:

creating a plurality of queues, wherein each one of said queues corresponds to one of said media (see column 2, lines 15 and column 4, lines 5 – 10);

placing said requests on the created queues, wherein each request is placed on the queue corresponding to the medium on which the requested data object is located (see column 3, lines 34 – 37 and column 6, lines 43 – 44);

activating a first of said queues, said first queue being associated with a first of said plurality of media (see column 5, lines 10 – 67); and

retrieving, from said first medium, the data objects requested on the first queue (see column 5, lines 30 – 36 and column 7, lines 2 – 17).

Lerman does not explicitly teach receiving a plurality of requests to recall data objects, each data object being located on a particular one of said plurality of media.

However, Pence teaches receiving a plurality of requests to recall data objects, each data object being located on a particular one of said plurality of media (see column 2, lines 56 – 58).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify teaching of Lerman with the teaching Pence wherein the queues of Lerman could be modified to receive a plurality of recall request. The motivation is that Pence teaching of a priority of data that are associated with each recall request in the queue could also be applicable to a plurality of queues. These data could be stored or recalled in a plurality queues as well as a single queue.

Regarding claim 2, Lerman and Pence disclose the claimed subject matter as discussed in claim 1. Lerman further discloses wherein each queued request indicates the offset from a predetermined location on a medium at which the requested data object is located, and wherein said placing act comprises:

organizing the requests on each queue in a first and a second sequence, each sequence comprising a set of requests whose offsets are monotonically increasing

within the respective sequence (see column 8, lines 57 – 67, column 9, lines 1 – 23 and column 10, lines 45 – 46).

Regarding claim 3, Lerman and Pence disclose the claimed subject matter as discussed in claim 1. Lerman further discloses activating a second of said queues, said second queue being associated with a second of said plurality of media, the second medium being different from said first medium (see column 10, lines 30 – 33); and

retrieving, from said second medium, the data objects requested on the second queue, the retrieval occurring at least in part concurrently with the retrieval of data objects from the first medium (see column 1, lines 39 – 42 and column 10, lines 60 – 61).

Regarding claim 7, Lerman and Pence disclose the claimed subject matter as discussed in claim 1. Pence further discloses wherein the act of creating a plurality of queues comprises time stamping each of the created queues, and wherein the act of activating a first of said plurality of queues comprises selecting a queue to be activated based on the timestamps of the respective queues (see column 2, lines 57 – 58; column 5, lines 51 – 52; column 7, lines 60 – 67 and column 8, lines 1 – 4).

Regarding claim 9, Lerman and Pence disclose the claimed subject matter as discussed in claim 1. Pence further discloses wherein said method is performed in a computing environment comprising a hard disk, said method further comprising:

determining that said data objects are not located on said hard disk (see column 3, lines 59 – 66).

Claims 10 is essentially the same as claim 1 except that it sets forth the claimed invention as a computer-readable medium having computer-executable instructions rather than a method and therefore rejected for the same reasons as applied hereinabove.

Regarding claim 22, Lerman does not explicitly disclose a hard disk; a file system which manages files on said hard disk, which stores to information indicating which of said files have been migrated to said media, and which issues a request to said queuing module for requested files that have been migrated to said media.

However, Pence discloses a hard disk (see column 3, line 34);

a file system which manages files on said hard disk, which stores to information indicating which of said files have been migrated to said media, and which issues a request to said queuing module for requested files that have been migrated to said media (see column 1, lines 34 – 41 and column 6, lines 35 – 36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify teaching of Lerman with the teaching Pence wherein the hard disk is a storage device for the recall request queues. The motivation is that the hard disk provides more space for more frequently used data sets these devices. Consequently, this provides efficient storage and access on these queues.

Regarding claim 23, Lerman does not explicitly disclose wherein said queuing module timestamps each queue at the time that the queue is created, and wherein said activation module selects a queue for activation based on the timestamps of the created cues.

However, Pence discloses wherein said queuing module timestamps each queue at the time that the queue is created, and wherein said activation module selects a queue for activation based on the timestamps of the created cues (see column 5, lines 11 – 17 and 51 – 52; column 7, lines 60 – 67 and column 8, lines 1 – 4).

It should be noted that although Pence does not explicitly disclose "timestamps each queue at the time that the queue is created", Pence discloses in column 5, lines 51 – 52, " A timestamp field 46 indicates the time at which the recall request was initiated". It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Lerman with the teaching of Pence wherein Pence's timestamp field is modified to accommodate the creation data and time for each queue at the time of creation. The motivation is that timestamp makes it possible to serialize the queues according to time of creation. Timestamp also makes it to decide on which data and on which queue to recall.

Regarding claim 26, Lerman teaches wherein there is one queue for each of said media (see column 2, lines 26 – 28).

Regarding claims 28 and 29, Pence teaches said media is capable of being mounted on any one of plurality of drives, and wherein each medium corresponds to a particular one of the queues regardless of which drive the medium is mounted on (see Fig.5, steps 62, 64, 66, 68 and 70).

Regarding claim 30, Pence teaches wherein each of the queues corresponds to a particular one of the plurality of media, wherein each of the media is capable of being mounted on any one of a plurality of drives, and wherein each medium corresponds to a particular one of the queues regardless of which drive the medium is mounted on (see Fig.5, steps 62, 64, 66, 68 and 70).

4. Claims 4, 5, 6, 8 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lerman in view of Pence and further in view of U.S. Patent 6,178,519 issued to Roger N. Tucker (hereinafter "Tucker").

Regarding claim 4, Pence and Lerman disclose the claimed subject matter as discussed in claim 1. Pence or Lerman does not explicitly disclose wherein each of said queues comprises a linked list of requests.

However, Tucker teaches wherein each of said queues comprises a linked list of requests (see column 7, lines 29 - 33).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Tucker with the teaching of Pence and

Lerman wherein the area linked list of request stored in a free space. The motivation is that each buffer is holding area for request and this makes the processing quick and efficient.

Regarding claim 5, Tucker discloses further comprising querying a database to determine the locations of the requested data objects (see column 1, lines 40 - 57).

Regarding claim 6, Tucker discloses wherein the location provided by said database comprises a media identifier and an offset into the identified medium (see column 3, line 62 – column 4, line 7).

Regarding claim 8, Pence and Lerman disclose the claimed subject matter as discussed in claim 1. Pence further discloses said method being performed in a multi threaded environment wherein plural threads execute concurrently, said method further comprising:

placing a request on a queue (see column 6, line 58); and

changing a queue from a non-active state to an active state (see column 7, lines 8 – 18); and

said lock being acquirable by only one of said threads at a given time (see column 7, lines 8 - 18)

Pence or Lerman does not explicitly teach acquiring a lock prior to performing an action selected from the group consisting of: said lock being acquirable by only one of

said threads at a given time; and releasing said lock subsequent to performing an action in said group.

However, Tucker teaches acquiring a lock prior to performing an action selected from the group consisting of (see column 3, lines 17 - 25); and

releasing said lock subsequent to performing an action in said group (see column 9, lines 4 - 11).

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Tucker with the teaching Pence and Lerman wherein the lock are released during shutdown or system crash. The motivation is that this release enables the system to apply the update prior to system shutdown.

Regarding claim 24, Lerman teaches wherein each requested data object is located at an offset into the medium on which the data object is located, and wherein said queuing module includes logic which maintains the requests on each of said plurality of queues in first and second sequences the offsets of the data objects requested in each of said first and second sequences comprising a maximally monotonically increasing series (see column 4, lines 34 – 41, 64 – 67 and column 5, lines 1 – 9).

Lerman or Pence does not explicitly teach the offsets of the data objects

However, Tucker teaches the offsets of the data objects requested in each of said first and second sequences comprising a maximally monotonically increasing series (see column 3, lines 63 - 64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Tucker with the teaching of Lerman and Pence wherein offset are translated into real address. The motivation is that the offset helps to limit the total database size to the size of usable virtual address.

5. Claims 11, 12, 14, 15, 16, 17, 18, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,072,766 issued to Michael V. Konshak (hereinafter "Konshak") in view of Lerman.

Regarding claim 11, Konshak teaches in a computing environment having a first plurality of drives in which data objects to be retrieved are stored on a second plurality of media mountable on said drives, a method of obtaining data objects from said media comprising:

identifying a first data object located on a first of said media (see column 2, lines 25 - 33);

identifying a second data object located on a second of said media different from said first medium (see column 2, lines 33 - 37); and

Konshak does not explicitly teach concurrently using a first and a second of said drives to retrieve said first and second data objects from said first and second media.

However Lerman teaches concurrently using a first and a second of said drives to retrieve said first and second data objects from said first and second media (see column 1, lines 39 - 42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Lerman with the teaching of Konshak wherein objects retrieved concurrently from the two media. The motivation is that this concurrent transition saves time.

Regarding claim 14, Konshak and lerman teach the claimed subject matter as discussed in claim 11.

Lerman teaches further comprising:

identifying a third data object located on a third of said media (see column 7, lines 11 – 23);

waiting for said first or said second data object to be retrieved from their respective media (see column 7, lines 22 – 23 and column 8, lines 48 - 65); and

retrieving said third data object from said third medium (see column 7, lines 11 – 23).

Regarding claim 12, Lerman teaches

creating a first queue corresponding to said first medium (see column 4, lines 1 – 15);

placing first data on said first queue, said first data being indicative of said first data object (see column 4, lines 34 – 41);

creating a second queue corresponding to said second medium (see column 4, lines 1 – 15); and

placing second data on said second queue, said second data being indicative of said second data object (see column 4, lines 34 – 41).

Claims 15 is essentially the same as claim 11 except that it sets forth the claimed invention as a computer-readable medium having computer-executable instructions rather than a method and therefore rejected for the same reasons as applied hereinabove.

Regarding claim 16, Lerman teaches a method of scheduling requests to recall data objects from a medium, said medium being mounted on a drive, said drive having a reading head, said method comprising:

receiving a new request to recall a data object from said medium, said data object being located at a first offset along said medium (see column 4, lines 22 - 28);

identifying a queue comprising a plurality of requests to recall data from said medium, said requests having an order, each of said requests corresponding to a particular data object stored on said medium and indicating an offset into said medium at which the corresponding data object is located, said requests forming first and second sequences, said first sequence preceding said second sequence in said queue

with respect to said order, wherein the offsets of the requests within said first sequence are a maximally monotonically increasing series (see column 4, lines 16 – 41); and

inserting said new request into said queue into a position that, with respect to said order, is subsequent to said first sequence (see column 4, lines 37 - 41).

Lerman does not explicitly teach determining the location of said reading head along said medium; determining that the location of said reading head is beyond said first offset.

However, Konshak teaches wherein the offsets of the requests within said first sequence are a maximally monotonically increasing series (see column 5, lines 7 - 66);

determining the location of said reading head along said medium (see column 7, lines 39 – 46);

determining that the location of said reading head is beyond said first offset (see column 8, line 9 – column 9, line 21);

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Konshak with the teaching of the teaching of Lerman wherein shaft and drive locate the position of the head. The motivation is that this arrangement makes it possible to move from one bin to another to select a particular data.

Regarding claim 17, Lerman discloses wherein the offsets of the requests within said second sequence area maximally monotonically increasing series (see column 4, lines 34 – 41, 64 – 67 and column 5, lines 1 - 9).

Regarding claim 18, lerman discloses wherein the position in said second sequence in which said new request is inserted is based on said first offset, such that the monotonically increasing nature of said second sequence is preserved following the insertion (see column 4, lines 34 – 41, 64 – 67 and column 5, lines 1 - 9).

Regarding claim 19, lerman discloses selecting, from among a plurality of queues, a particular queue into which to insert said new request, wherein each one of said plurality of queues corresponds to a different medium, the selection being based on the particular medium on which the data object is located (see column 4, lines 16 - 41).

Claims 20 is essentially the same as claim 16 except that it sets forth the claimed invention as a computer-readable medium having computer-executable instructions rather than a method and therefore rejected for the same reasons as applied hereinabove.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Konshak in view of Lerman and further in view of Pence.

Regarding claim 13, Konshak and Lerman teach the claimed subject matter as discussed in claim 12, Pence further teaches wherein said first data comprises a location of said first data object on said first medium, and wherein said second data

comprises a location of said second data object on said second medium (see column 12, line 66 – column 13, line 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Pence with the teaching of Lerman and Konshak wherein objects stored seperately. The motivation is that this different storage enable concurrent transition.

7. Claims 21 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lerman.

Regarding claim 21, Lerman teaches a system for retrieving data objects from a plurality of media comprising:

a queuing module which creates a plurality of queues corresponding to said plurality of media, said queuing module receiving requests to retrieve data objects from said plurality of media and queuing each of said requests on the queue corresponding to the medium on which the requested data object is located (see column 2, line 15; column 3, lines 34 – 37; column 4, lines 5 – 10 and column 6, lines 43 – 44);

an activation module which selects queues for activation and activates the selected queues (see column 5, lines 10 – 67); and

a retrieval module which retrieves the items on one of the selected queues from the corresponding medium in the order in which the items are located on the queue (see column 5, lines 30 – 36 and column 7, lines 2 – 17).

It should be note that although Lerman does not specifically states, "activation module which selects queues for activation and activates the selected queues", however, Lerman teaches in column 5, lines 22 - 27 "As an optional step, once a request is selected, the SDS Selection Procedure checks whether the data for the selected read request is already in cache (if caching is used). If this is the case, the disk access request can be discarded and the Selection Procedure is repeated"; also in column 5, lines 37 – 40, Lerman also discloses "Each queue maintains "a sum of the worst case values" selector that performs a worst case analysis and selects the queue that will be used (in steps 320 and 330 described below) to send the next command to the disk drive". Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious and motivating to modify the selection procedure to activate the selection of queues. The motivation is that this procedure is a computer code that activates and selects the queues automatically.

Regarding claim 27, Lerman teaches wherein there is one queue for each of the plurality of media (see column 2, lines 26 – 28).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred I. Ehichioya whose telephone number is 571-272-4034. The examiner can normally be reached on M - F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fred I. Ehichioya
Patent Examiner
Art Unit 2162

December 28, 2004

M. ALI
Primary Examiner